Ag Decision Maker

File B2-67
October 2009
www.extension.iastate.edu/agdm

Lean Hog Futures Forecast Errors, 1990-2008

The Live and, more recently, Lean Hog futures market is a single location where anyone with an opinion on what prices will be in the future can essentially vote their forecast. The resulting futures prices represent a "composite" forecast at a particular point in time. However, futures markets trade on information and react as new information becomes available. Research has repeatedly shown that the futures are as accurate, or better, than other forecasting methods, but just how good of a predictor are futures?

This simple analysis compares the Live/Lean futures price to the contract maturity price to evaluate its accuracy. Five forecast periods, 8, 16, 24, 32 and 40 weeks out, were evaluated for each Live/Lean Hog contract from February 1990 to June 2009. The forecasts were the average futures closing prices for the selected week (Monday-Friday) compared to the maturity price, which was the average price of the last five trading days of each contract.

The forecast error was defined as the futures price at maturity minus the futures price at time X. A positive error means the forecast was too low. A negative error means the forecast was too high. In efficient markets, one would expect that the forecast error would average $0 and there would be no predictable pattern to the errors.

Results

The forecast error is measured as a percent of the futures price at maturity. Figure 1 shows the 24 week forecast error for all 117 contracts. It shows that the errors are distributed around 0% in a random pattern. One extreme event that stands out is the December 1998 contract. Due to unforeseen market conditions, the forecast price was approximately 125% higher than the maturity price. One contract's error was missing due to a lack of price information (February 1990), 48 of the errors were negative, and 68 were positive. Approximately 27% of errors were within +/- 5% of 0 with 29% less than -5% and 44% greater than 5%. While there are examples of extended periods of time with over and under forecasting, the patterns do not appear to be predictable.

Figure 2 reports the forecast error by contract and time to maturity. There is not a consistent pattern across the contracts. February, April, and October vary widely on average. June (with the exception of 8 weeks out) and August tend to under forecast on average. December tends to over forecast on average. On average, all contracts have a slight tendency to over forecast. It is important to remember that there are only 19 numbers at most in each of these averages, and a large error in any one year can change the average dramatically. Such could be the case with December and its 1998 contract. This one error could affect the overall results as well. Keep in mind that research such as this has consistently shown that markets are efficient and that highly predictable patterns in the data that could be used to generate a profit will be exploited until the profits are bid out of the system.

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Figure 1. Percent Error for Live/Lean Hog Contracts at 24 Weeks Out.

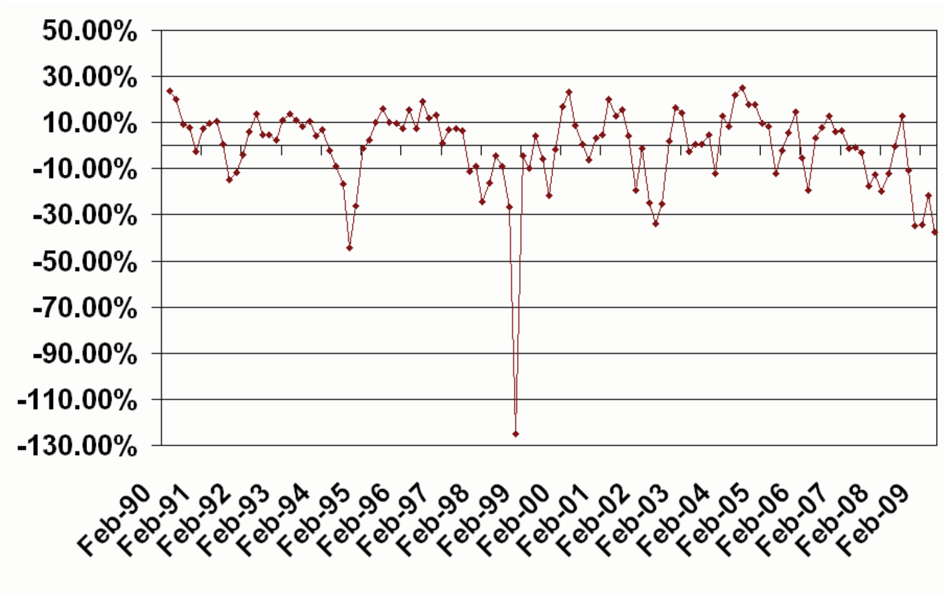
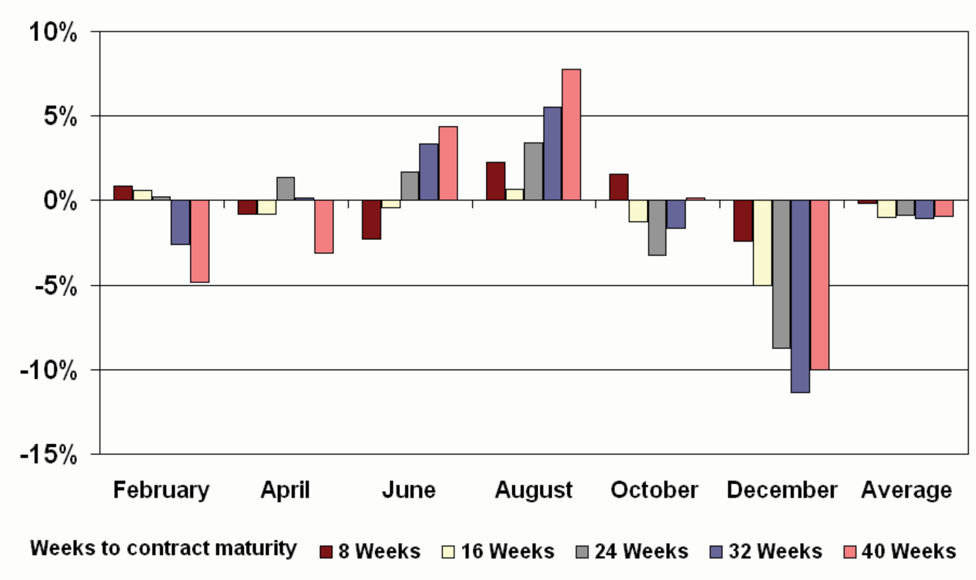


Figure 2. Average Percent Forecast Error by Contract and Weeks to Maturity, 1990-2008.



It is important to know more than the average about the forecast errors. Table 1 reports the average and standard deviation for each contract month by time to maturity. Standard deviation is a measure of variability around the average, and under normal conditions the actual forecast is expected to be within plus or minus one standard deviation of the average approximately two-thirds of the time. A larger standard deviation indicates more variation in the error. With all months, the variation in the errors tends to get larger further from maturity.

Table 1. Average & Standard Deviation of Forecast Error by Contract & Weeks to Maturity.

Weeks		Feb	Apr	Jun	Aug	Oct	Dec
8	Avg	0.9%	-0.8%	-2.3%	2.3%	1.6%	-2.4%
	StDev	9.9%	12.7%	9.7%	7.4%	12.2%	17.3%
16	Avg	0.6%	-0.8%	-0.4%	0.7%	-1.3%	-5.0%
	StDev	7.0%	16.0%	13.8%	8.9%	14.7%	22.3%
24	Avg	0.2%	1.4%	1.7%	3.4%	-3.2%	-8.7%
	StDev	13.6%	14.9%	15.4%	12.3%	16.2%	31.7%
32	Avg	-2.6%	0.2%	3.3%	5.5%	-1.6%	-11.3%
	StDev	16.2%	19.5%	15.5%	13.2%	20.4%	33.8%
40	Avg	-4.8%	-3.1%	4.4%	7.7%	0.2%	-10.0%
	StDev	17.4%	20.3%	20.9%	13.5%	20.6%	35.1%

Table 2 below provides the average and standard deviation of the forecast error by weeks to maturity across all contracts. With the exception of 24 and 40 weeks out, the average forecast error increases as time to maturity increases, and the overall forecast error is quite small at -.8% (.8% of $50/cwt is $.40/cwt). Variation in all contracts, on average, decreases as maturity nears. This is expected because as more and more information becomes available as maturity approaches, people are better able to make pricing decisions

Table 2. Average & Standard Deviation of Hog Futures Forecast Error by Weeks to Maturity, All Contracts, 1990-2008.

Forecast	8 wks out	16 wks out	24 wks out	32 wks out	40 wks out	Overall
Average	-0.14%	-1.02%	-0.84%	-1.05%	-0.93%	-0.80%
Std. Dev	11.78%	14.41%	18.53%	21.08%	22.63%	17.68%

This analysis is intended to provide some insight into how accurately Lean Hog futures predict contract expiration prices. As shown by these errors and standard deviations, there is significant variability, and a contract may under or over predict prices, in any one year, but overall, futures contracts are very useful as predictors of maturity prices.

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Jack M. Payne, director, Cooperative Extension Service, Iowa State University of Science and Technology, Ames, Iowa.